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V

The Relation Between Elementary and High Schools

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IN the early history of our country there was no connection between the elementary and secondary schools. Those who attended the secondary school were there prepared for college, while those who attended the elementary school did not expect to go on with their work beyond the range of the studies ordinarily found in the school which they attended. The problem of the relation between the elementary and the high school became important with the rise of the free secondary school, which we know commonly to-day as the high school. In the beginning the high school was intended primarily to furnish an education somewhat in advance of that to be had in the elementary school, but there was little or no definite connection between the high school and the college. Only a few of the more favored high school students found their way into the colleges. But with the growth of the high school movement there came a closer relationship between the high school and the college, an increased

number of high school students went to the university to take up more advanced work, and the high school tended to take the place of the academy, which had heretofore been the preparatory school for the college. Finally it came to be commonly understood that the high school was the connecting link between the elementary school and the college. The system of public education is thought of as continuous, extending from the elementary school to the university. High schools began to become numerous about the middle of the last century, but it has been during the last twenty-five or thirty years that they have increased most rapidly, and that the problem of the relation of the different units of our system of public instruction has been most discussed.

The problem of the relation of the elementary and high school has arisen largely because of the intermediate position which the high school holds. There has been in the minds of very many the feeling that the high school is distinctly a preparatory school for the college, that the work which is done there is not of very great value to the one who does not expect to go on farther, and hence, the problem of the relation of the curriculum of the high school to that of the elementary school has arisen. Which of the high school subjects could well be introduced into the elementary school curriculum, and how the work of the high school could be made to grow out of the pupil's experience in the elementary school—how to bridge the gap on the side of subject matter and instruction—are questions which have been much discussed.

In addition, there has been the problem of organization. It has been ordinarily recognized that the teacher in the high school needs to be somewhat of a specialist in order to give the advanced instruction which the high school curriculum calls for. The question of the relationship of the two schools becomes important, therefore, when we remember that it is still customary in the majority of our schools to have but one teacher for all subjects in the upper grades of the elementary school. In this same connection, too, there arises the problem of the method of presentation of subject matter in the two schools, for it has been thought by many that there was a tendency on the

part of the high school teacher to place relatively too much emphasis upon the knowledge of subject matter and to care too little for acquiring skill in teaching.

In this paper it will be assumed that it is desirable that many more of the elementary school pupils should go on to the high school than is now customary; and also that the pupil who enters the high school shall have a reasonable hope of succeeding with the work. It is from this point of view that we shall discuss the relationship of the two schools. This means that there must be a unity of aim found in the work of the two schools; that in the high school, as well as in the elementary school, it shall be felt that the work is worth while in itself and not valuable simply as a preparation for some higher training which is to follow; also that the child shall be definitely prepared in the lower school for the more advanced work which he is to do in the high school.

The first essential, if the high school is thus to fulfill its function, is that the elementary school pupil shall care to go ahead with his work. He ought not only to be able to see some connection between what he has done and what he is to do, but he ought also to feel that the advanced work which he is to take up will really have a direct bearing upon his life work. The high school is not to be thought of by him merely as a preparatory school for college, but rather as a place where the interests which have already been awakened may be followed up, a place where he may prepare himself to take his place in the society in which he lives. In other words, the high school should be broadly vocational.

But it is not sufficient that the pupil be simply interested in the more advanced work which he is to pursue. He must in addition have developed enough ability to make him successful in his study. Interest in any line of effort will soon die if the difficulties presented are too great. The movement in school work from the elementary school to the university ought to be constantly away from the careful direction and help which the teacher must give in the early years, toward the almost independent work of the research student. The beginning of this independence cannot safely be put off until the child enters the

high school. Outside of school the child of twelve and fourteen years of age is becoming more and more independent in thought and in action. If the school is to hold him, to keep alive his interest and make him feel that his study there is worth while, he must find in it some opportunity to exercise his increased power of thought and enlarged interest in activity. The high school has required that its pupils work with much less direction and help than is ordinarily found in the elementary school. The great problem for the elementary school therefore is, How to keep alive and nourish in the child his tendencies to independent thought and action. In short, the child must be taught how to study in the elementary school, not only in order that he may be able to go on with the more advanced work, but also in order that this work shall appeal to him as worth while.

Let us consider what is involved in this problem of teaching children how to study. People have been accustómed to think that good instruction carries with it good habits of study. And yet bad habits of study are a cause of common complaint even among the best instructors with reference to their own pupils. The ways of studying in private are far inferior to the ways of instruction. The tests that have been imposed upon pupils have made so little demand upon their ability to study, and have placed such premium upon mere memorization, that it is not infrequent to find classes who learn their lessons well from day to day, yet do not really know how to study those lessons. Even where the instruction has been considered excellent, the requirements made upon pupils in their class work have done little towards giving them the ability to work outside of class. In class it is common for the teacher to take the initiative, to ask the questions, break the subject up into its parts and carry responsibility—in a word, to furnish the energy and do most of the real work of the recitation. Thoroughly skilled teachers pride themselves on finding the questions that "just fit." They aim to put the best questions they can, to make the recitation move along without friction. In many of the recitations of the elementary school the teacher is the leader; his personality is drawn upon for stimulus; he both puts the questions and makes

the corrections; he is more active than his pupils, and is doing most of the work. Now, pupils may "get along" under such a régime in the elementary school, where by far the greater part of their study is done under the immediate direction of teachers; but when they get to the high school, where they are expected to do their studying outside of school, and where their success largely depends upon their ability to master their lessons without much help, if they do not have the ability to study they are likely to become discouraged and leave school. Hence, if you want pupils to act independently in the high school they must be carefully prepared for such independence in the lower school. As we advance in the grades we ought to expect that the teacher will become less active in the recitation period, and conversely that the pupils will be called upon more and more to exercise their own judgment and to take the initiative.

In the elementary school there ought to be certain periods set aside during which definite instruction should be given the children in proper methods of study. If we simply demand information without paying close attention to the method by which it is acquired, we have neglected the most important part of our duty. The child in the elementary school is capable of studying, even in the very best sense of the word, but that capability must be carefully developed by the teacher if it is to become an actuality. The fact that a child can repeat the words which we have asked him to commit to memory ought not to satisfy us. There are right and wrong ways of memorizing. In reading books it is essential that one be able to pick out that which is essential, the main points that bear on the topic in hand. The amount of reading required increases as we go from the elementary to the high school, and hence the necessity of teaching children how and when to read rapidly or slowly and when to skip. How the table of contents and the index of reference books may be used to advantage are also part of this problem. It would help students very much in their high school work if proper standards of thoroughness had been developed in their elementary school experience. Some students are inclined to believe that nothing short of the mastery

of the words and every fact of the book which they read is sufficient. They have never realized that the important thing is the main thought expressed rather than the words which are used and the non-essential or little things; and consequently when the demand is made that they greatly increase the amount of their reading they tend to become discouraged, and to feel that they lack the ability required.

Our discussion thus far has dealt chiefly with the work which the elementary school needs to do in preparing pupils for the high school, but surely no one would be willing to say that the fault has been wholly on the side of the elementary school. If we need more effort in the elementary school tending to make pupils independent and self-reliant, we need more care on the part of high school teachers in regard to the method of presenting subject matter. In our schools, as they are at present administered, it is very common to find the very best teachers of the elementary school in the upper grades. When the pupil enters the high school he often finds less experienced and less skillful instructors, and, owing to departmental organization, he may find much less sympathy and much less opportunity to receive needed help and direction. In order that the transition may seem less abrupt, it is desirable—as is now done in some schools—that teachers, for the first year of the high school in particular, be selected not only because of their knowledge of subject matter, but also because of their ability to teach. More than this, it is essential, if the pupil is to find proper sympathy and direction, that he be responsible for his work in at least two or three subjects to one teacher, so that the latter may come to know his peculiar interests and his ability intimately.

In brief, the proper relation between high and elementary schools involves (1) a unity of aim. In both places children should gain that insight into social conditions and that sympathy with social demands which will make for effective social participation. (2) There should be no sudden increase in the demand which is made upon them for independence in thought and action. In the elementary school children should become increasingly self-reliant, should be expected in a larger degree than is at present common to take the initiative, should be taught how to

study. The high school should begin where the elementary school leaves off. There is still need for motivation of work and for the highest type of teaching ability. Children when they enter the high school do not suddenly outgrow the need of sympathetic direction in their work. Some one teacher at least in the high school should be well enough acquainted with each pupil to give sound advice concerning the course which he should pursue, and to render judgment concerning his work. This requires that such a person see that pupil oftener than one period a day in a single subject.

When children and parents feel that high school work is a preparation for life work, when the elementary school provides for a degree of independence in thought and action commensurate with the child's ability, and when the high school makes no greater demand, then will the number of successful high school students be greatly increased.

Moments Musicals

ELMER JAMES BAILEY

Three golden moments have been mine in life—
  Three moments when the gates of heaven swung
A little back; and all the earth was rife
  With raptured joy from out that city flung.
Once when I played the Creole's anguished cry,
  I turned to find your eyes were fair and bright;
And once when you were near, I could but try
  To make Chopin tell how my heart was light.

But all that even Beethoven might do
  Could not give voice to my exultant soul,
When one rare smile leaped forth to me from you,—
  For, lo ! I felt the unseen aureole,
And silent bowed my head before the crowned,
Feeling the place indeed was holy ground.

Youth and the Sunshine

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NOTE.—We depart from the traditional policy of EDUCATION so far as to admit a story to this number. This we do because we believe that there is a distinct pedagogical significance to Mrs. Milner's excellent narrative, which will make it of real value to our readers —EDS. EDUCATION.

AS the hands of the clock in the senior study room of the Grafton High School pointed to one, the boys and girls moved to their seats and took up the business of the afternoon. They waited neither for teacher nor signal, for Miss Wilson had convinced these two hundred young people that they could tell time as well as she, and that there was no reason why she should hurry back at noon to ring a bell.

Within a few minutes Miss Wilson came into the room, and then one understood that such a woman might govern from a distance. Her gray hair was soft about her face. Her eyes were clear and somewhat piercing, but the boys and girls knew the look of sympathy that burned in their depths. She wore a fresh white dress, and a hat with a soft, white scarf twisted around it, and in her hand she carried a bunch of roses that one of the girls had just given her.

As it was nearly time for the formal opening of the afternoon session, she did not stop to remove her hat, but went about the room as though it were her own home, giving a direction here, asking a question there, and exchanging a look with others as she passed them. When she returned to her desk she found a vase already filled with water, for the girls knew her loving care for flowers.

The boys and girls appointed to that duty took the roll, and Miss Wilson arranged her roses, touching them with caressing hand, and glancing now and then at the roomful of young people.

To-day they seemed especially attractive. It was very warm, and for the first time the girls were clad in their pretty summer dresses, and the mingled white and pink and blue, with here and there a touch of green, attracted her artistic eye, and delighted her sense of color. She never tired of the flower faces of the girls, and the self-reliant looks of the boys.

As her eye wandered from seat to seat she missed one girl. "Where is Edith?" she thought. "She was here this morning." She glanced across the room. "Charlie is gone, too."

Just then the bell rang, and the classes for the first period passed to recitations. When those in the room had settled to study, Miss Wilson walked to the window and looked down the street. The missing young people were not in sight. Slowly drawing the pins from her hat she wove them in and out through the crown as she pondered the situation. The summer breeze stirred in the trees, and the rustling leaves whispered of the woods with enticing murmer.

Miss Wilson, despite her gray hair, kept close to the hearts of her girls and boys, and knowing the devotion of Edith and Charlie to each other she suspected that youth and the sunshine had called louder than school and duty. With a half-troubled, half-indulgent smile, she turned from the window, took her hat to the cloak room, and began work at her desk.

The afternoon wore away with thoughts turned often to the truants, and Miss Wilson pondered carefully what she should say to them on the morrow.

The next morning the sunshine had vanished, the rain was pouring down in torrents, the pretty light dresses were replaced by storm suits, and the whole scene was changed. Miss Wilson was at her desk early, for she knew that in such weather it was well to be in advance of the school, as they would need her calmest nerves and steadiest hand.

Soon after her arrival Edith came into the room. One of the rules of the school said, "Absence and tardiness shall be reported immediately upon entrance to the room," and no one was allowed to resume class work without a written excuse from Miss Wilson.

Edith came at once to the desk. "Miss Wilson," she said, "I was absent yesterday afternoon."

"Yes," was the reply.

"May I have an excuse?"

"You have not yet explained your absence."

"Well, you see ——," and she hesitated. "Why, you know how far out our home is, and my auntie, with whom I live, came down town, and I lunched with her at the hotel, and when we got through it was so late that she said it would not pay for me to come back to school."

"Is it possible that Edith would attempt to tell me what is not true?" Miss Wilson wondered; and she thought hard while she hunted on her desk for paper. But let that be as it might, her invariable policy was to take the word of her young people, unless she had absolute proof against them. Here she had only her instincts, and some natural deductions, against the word of a girl whom she had always found honest, so she took up the excuse blanks and wrote

EDITH THOMPSON

Abs. Tuesday P. M.

X

June 3 F. W.

In handing the slip she held it until she caught the girl's eye, and then looked steadily at her until Edith's glance fell, but neither spoke.

Just before the last bell rang Charlie came into the room with a rush.

"Miss Wilson, please give me an excuse for my absence yesterday. My mother sent for me to meet her down town, and I had to attend to some business with her." And he stuffed his hands into his pockets with an indifferent manner.

Miss Wilson made no reply, wrote the excuse, but managed to catch his eye as she handed it to him. He did not lower his glance, but half snatched the paper and whirled away.

The morning took on much of the discomfort of the weather, and Miss Wilson had need of her clear head and sympathetic nature to make things go at all smoothly. Edith was abstracted and idle, and Charlie banged about in his seat, dropped his books, and blustered as most boys do in their don't care moments.

When they came to Miss Wilson's geometry class, Edith didn't hear the proposition assigned to her, and Charlie made meaningless lines on the board, rubbed them out, dropped the eraser, tramped chalk into the floor, and finally gave up and called it a failure. Miss Wilson withheld reproof, but occasionally turned a steady gaze upon each, as though she were searching for the truth that must be found.

At noon Edith and Charlie went down the hill together under the same umbrella and in earnest conversation.

By afternoon the clouds had lifted, and with returning sunshine the usual quiet returned to the room. The first hour was a leisure one for Miss Wilson. As she sat at her desk busy over papers someone drew a chair to her side, and without looking up she guessed who it was and said, "What is it, Charlie?"

"Miss Wilson, Edith has made me come to tell you that we both lied to you this morning."

"I feared so at the time."

"Edith said she knew you did not believe her, and she has been so unhappy all the morning that I could not stand it any longer."

"Well, tell me about it."

"She didn't go to luncheon with her aunt, and I never saw my mother. It was such a beautiful afternoon that I teased her to go for a drive. She didn't want to go at all, for she said you would find it out, or that she would have to tell you."

"Did you have a happy time?"

"A happy time? I should say not! Edith was as glum as could be, and couldn't think of anything except that she had run away from school."

"And you?"

"Boys don't care about things as girls do. But I didn't like to see Edith feel so bad."

"But why did you think you needed to lie to me about it? Do you think because my hair is gray that I cannot understand how strongly, on a summer day like yesterday, the open country calls to young people who care for each other?" and her eyes looked over the heads of the school as though she saw far into the past.

"Would you have let us go if we had asked?"

"Perhaps I might have remembered my own youth," she replied, half to herself.

"Miss Wilson, will you forgive us and punish me? It was all my fault. I planned it and made her promise to lie to you. Don't punish Edith."

"Edith has had her punishment already. As for you, let me say that when a young man has so won the regard of a girl that she will lie at his direction, he has gained a power that it behooves him to use for good rather than for evil."

Charlie looked in amazement at a teacher who could be content to leave with him the burden of his own wrongdoing, and then he realized that she had swept beyond the question of school discipline to a life lesson.

Just then the period closed, and Edith, coming from a recitation, saw Charlie and Miss Wilson together and knew that the confession had been made. She cast an inquiring glance at Miss Wilson, and received a kindly smile in return.

In a few minutes Miss Wilson passed her desk and laid a folded paper upon it with this quotation from George Eliot, "It was not worth doing wrong for; nothing in this world is."

And there the matter dropped, for Miss Wilson possessed that rare wisdom to know that silence now was better than much speaking.

Radium and its Wonders

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THE twentieth century seems pre-eminently an age of discovery and invention, and so many marvelous things are brought to our attention from time to time that we are now quite prepared to accept any startling statement concerning a new discovery without an attempt to satisfy ourselves as to its correctness or validity. Taking advantage of this tendency, not a few unscrupulous writers have written a great deal of nonsense about this thing and that thing, with no higher motive than to fill up so much space at the usual space rates in the current magazines, and perhaps no subject has been more abused in this way than that of radium.

However, the discovery of radium may be justly regarded as one of the greatest feats of modern science, and since the discovery of Roentgen rays no other one has aroused keener interest or more serious speculation than that of radium by Professor Curie and his gifted Polish wife in 1897.

It is one of the three elements which are now spoken of as radio-active elements. The other two, uranium and thorium, have long been known, although the properties that now make them interesting were discovered only at a comparatively recent date. At the present time it is believed that many other radio-active elements exist whose discovery may be confidently expected at any moment.

Nevertheless, radium possesses the distinctive properties of radio-activity in such a very high degree that it is by far the most important element of this class. These substances, no matter how they may differ otherwise, all exhibit one property in common in that they emit spontaneously certain peculiar rays called Becquerel rays, which act on photographic plates, discharge electric bodies, excite phosphorescence and produce many other important effects.

Like X-rays, Becquerel rays are able to pass to some extent through all substances, but the denser the substance is, the greater is the opposition which it offers to their passage. These rays cannot be brought to a focus by a lens, therefore the photographic prints made by them are only shadow pictures resembling those made by Roentgen rays.

In observing the effect on a charged electroscope when a salt or mineral containing uranium was brought near it, Madame Curie noticed that the rate at which the gold leaves fell together was more rapid with certain specimens of pitchblende than could be accounted for by the uranium alone, and so she concluded that the effect on the electroscope was produced by the presence of some other element.

Acting on this supposition she separated the mineral into its groups of constituents—uranium, iron, lead, barium, bismuth, etc., and tested each group as to its power of discharge. At first she thought she had traced its discharging power to the bismuth group and attributed it to an element which she named polonium after her native country. About the same time Debierne, one of her co-workers in the same field of research, discovered another extremely radio-active body which he named actinium.

Subsequently, Madame Curie discovered another element of the barium group possessing enormous power of discharge, and to this element, which occurs in relatively greater amount than polonium, she gave the name of radium. A charged electroscope placed at a distance of several meters away can be discharged by a few centigrams of a radium salt. It has also been found that it can discharge an electroscope through a screen of glass or lead five or six centigrams thick.

A recent writer in speaking of Madame Curie's discovery says, "The task undertaken by her in attempting to separate radium from the numerous elements found in pitchblende is somewhat like that of a detective who starts out to find a suspected criminal in a crowded street without a clue, as pitchblende is one of the most complex of minerals, containing lead, chalk, silica, iron, and perhaps twenty or thirty other elements combined in a great variety of ways."

All these substances have to be eliminated in a series of complicated and costly operations. For days and days a ton or more of uranite powder obtained from pitchblende simmers over a slow fire with water and soda. This mixture is then put into barrels, where it is left until a sediment is deposited. The sediment is then washed and rewashed and put on the fire to simmer again with carbonate of soda. Then follows more sedimentation and repeated washings, after which the residue is treated with hydrochloric acid. A colorless liquid results, containing small quantities of radium. These small quantities are separated by a series of reactions and crystallizations. At each crystallization the crystals become more and more rich in radium and smaller in bulk, until after six weeks' manipulation some twenty-five grams of white crystals remain. The radium contained in these crystals is of low radio-activity. This bulk is repeatedly refined and reduced by succeeding crystallizations until there are in the end only a few centigrams left, or as much as would cover the point of a small knife blade, and this is all there is to show for a ton or so of uranite powder and months and months of hard work.

Radium chloride, which is the salt generally used for experiments, is a whitish powder, worth in an impure state nearly $150 per ounce. Thoroughly purified it would cost nearly $1,000 per ounce, but an order for that amount would certainly stagger the market. According to the statement of Madame Curie, we now possess only about a gram of the pure salts of radium. The atomic weight of radium according to present investigations is given as 225, but some of our leading scientists insist that in an absolutely pure state its atomic weight would be about 250. The low estimate found by Madame Curie is explained by the fact that the specimen examined may not have been entirely free from barium, with which it is usually very closely associated and whose atomic weight is only 137. In any event it is probably one of the heaviest metals known, is of a whitish appearance, is rather soft and is easily tarnished. Its chloride glows in the dark with a faint greenish white light and it starts a similar glow in other substances placed near it. This peculiar phosphorescent property

that it possesses, if it could be utilized with safety and the metal could be prepared at reasonable rates, might make it possible for radium to be used as a means of illumination and thus enlirely supplant electricity and gas in this sphere of usefulness. As we speculate upon such a possibility there is brought vividly to my mind the picture drawn by Lord Lytton in his Story of the Coming Race in which he speaks of an imaginary world placed in a mysterious subterranean region peopled by a race of imaginary beings called Vrilya, who produce all the phenomena of personal magnetism and possess the power of "perpetual light." How strange it would seem if these words should prove prophetic and should be realized! But we have only to turn to Jules Verne's Twenty Thousand Leagues Under the Sea and his fanciful sub-marine craft, which has been exemplified in the Holland sub-marine torpedo boat, to find a corresponding parallel in fiction. If this seemingly impossible thing proved to be not a mere dream, why should perpetual light from radium be regarded as purely visionary and entirely beyond the realm of possibility? Unfortunately for us, however, in this speculative dream, radium, besides its property of phosphorescence, has the power of sending out radiations very closely akin to X-rays in considerable variety, and the unwary experimenter has frequently been rewarded for his zeal and enthusiasm with savage burns. The effect of radium rays on living tissues is very marked. Serious sores have been produced by an exposure to the rays from strong radium for only five minutes. Curiously enough the effect does not show itself immediately, but develops several days after the exposure. So this deleterious feature would have to be eliminated in some way before radium could be utilized for illuminating purposes even if it existed in abundant quantities.

A photographic plate shielded from the rays of light by black paper is affected in a few seconds when placed close to the salt. Shadow pictures of metallic objects may also be obtained in a similar way in an hour or more. To obtain a shadow picture the oxide in powdered form is poured over the object in a heap at the center of the plate and direct contact with the plate is prevented by black paper. Dr. Meritt of Cornell University

made a shadow picture of a key in this way after subjecting the photographic plate to an exposure of forty-eight hours. However, several German scientists have secured fairly good results with only an hour's exposure.

Radium rays pass almost unobstructed through cardboard and thin wood and less easily through glass, through aluminum, and even through an inch of iron. Under the influence of radium glass acquires a violet color, while crystals of ordinary salt turn blue. In a darkened room radium will cause a real diamond to glow with a clear phosphorescent light, while imitation stones fail to respond. It is even claimed that diamonds of low grade when subjected to its influence for some time will undergo changes which improve their luster and brilliancy.

A strange feature of these rays is their behavior in the presence of a magnet. When a small portion of radium is placed in a cylindrical hole in a block of brass and the rays are allowed to pass out through a slit, under ordinary conditions the rays seem to travel in straight lines, but when the pole of an electro-magnet is placed beneath the plate and directly below the radium, the rays proceeding to the right are bent upward while those going to the left are bent downward. From this it is inferred that the rays consist in part of extremely small particles under a negative charge, smaller even than atoms which are shot out by the active substance, with a speed nearly equal to that of light.

Some would explain this as a case of slow atomic disintegration, and say that some violent commotion is in progress in which small particles of the atom itself are torn loose and projected into space with tremendous speed. Should future investigations establish the truth of this view, its importance in chemistry can hardly be over-estimated. If the atoms can be torn asunder why cannot the parts be put together, and would it not be possible to recombine them in such a way as to get a different kind of atom from the original one? If so, the transmutation of metals would be possible and the dream of the alchemists would be realized. The fact that fresh emanation from radium does not show the spectrum of helium, but as it ages or decays helium is produced in minute but ever increasing quantity, strengthens this view.

Scientists tell us that apparently some radio-active gas similar in character to the emanation of radium and thorium is present in the atmosphere all the time. Freshly fallen rain and snow are also active. If a little rain water is boiled until it has completely evaporated, the vessel in which it was boiled will give out Becquerel rays, although no visible residue is left.

All metals are slightly radio-active, while the whole surface of the earth is sending out Becquerel rays in small but measurable amount all the time.

The nature of radium radiations is very complex, but according to a recent article of Madame Curie's they may be divided into three distinct groups according to their properties.

One group is composed of radiations absolutely analogous to Cathode rays, composed of material particles called electrons, much smaller than atoms, negatively charged and projected from the radium with great velocity, which for some of these rays is very little inferior to that of light, and they are easily deflected by a magnet as previously mentioned. For convenience these are called Beta rays.

The second group is composed of radiations which are believed to be formed by material particles, the mass of which is comparable to that of atoms charged with positive electricity and set in motion by radium with a great velocity, but one that is inferior to that of the electrons. Being larger than the electrons and possessing at the same time a smaller velocity, these particles have more difficulty in traversing obstacles and form rays that are less penetrating. They are completely absorbed in passing through a few centimeters of air or a sheet of ordinary note paper. They are also less easily deflected by a magnet and always in the opposite direction to that found in the first group. They are usually designated as "Alpha rays."

The radiations of the third group are analogous to Roentgen rays and do not behave like projectiles and are not deflected by a magnet. However, they are very penetrating and have an appreciable action through twelve inches of solid iron. They seem to be produced at the moment of the sudden expulsion of the "Beta rays." For convenience these have been styled "Gamma rays." This constitutes the limit of all the generaliza-

tions that may be made on radiations from radium at this time, but it is possible that within the next twelve months, if future research is rewarded with the same success that has crowned our efforts in the past, we may confidently expect this limit to be greatly extended.

At the present time one of the most astonishing things noted in regard to the radio-activity of radium is that it persists indefinitely, while in other radio-active bodies this property diminishes. It also liberates heat spontaneously and continuously, and within the space of an hour can melt its own weight in ice. It always has a higher temperature than its surrounding objects, whatever they may be. All the while there is only a very slight diminution in weight. Heydweiller found that five grams of impure radium lost about .02 of a milligram per day.

According to the statement of a recent experimenter a glass vessel containing radium spontaneously charges itself with electricity. If the glass has a weak spot—for example when scratched by a file—an electric spark is produced at that point, the vessel crumbles like a Leyden jar when overcharged and the electric shock of the rupture is felt by the fingers with which you hold the glass.

It has been claimed by some that on account of this property radium will eventually become a factor in warfare in the way of producing explosions in a magazine of powder, causing the loss of ships and their crews on the sea and the loss and destruction of forts and batteries on land. But in speculating upon this possible use of radium we should not lose sight of the fact that radium is very dangerous to handle. One tenth of a grain brought in contact with the body is capable of producing complete paralysis. The same amount when brought in contact with a highly charged electric battery will cause an immediate explosion.

The effects of radium on animals varies and its whims are hard to explain. Applications of radium rays that create painful sores on the skins of guinea pigs only act as stimulants or irritants on the skins of rabbits, and in the latter case cause a prolific growth of hair. Perhaps the baldheaded fraternity

may fancy that relief is in sight for them when informed of this fact, but unfortunately the experiments were made with tan colored rabbits and the growth of hair incited by the radium rays was invariably snow white.

A curious experiment recently made at the Pasteur Institute will probably be of interest to us in our study of the effect of radium on animals. A minute glass tube containing a milligram of radium salt was inserted beneath the skin of a mouse only a month old just over the vertebral column. In three hours symptoms of paresis and ataxia ensued. In seven hours the mouse was seized with violent convulsions of lockjaw, and in twelve hours death occurred. Mice from three to four months old subjected to the same treatment died in a similar manner within a period of three or four days. Guinea pigs under the same conditions, in two days had their hindquarters completely paralyzed, their feet became stiff, and they died with lockjaw six days afterwards.

Adult guinea pigs and rabbits showed no immediate symptoms when placed under the influence of radium, but invariably died with lockjaw convulsions, after periods varying from six weeks to several months, according to the strength and vitality of the animal in each case.

Dr. E. C. London of St. Petersburg, Russia, in his experiments found that frogs, when placed in a vessel of water in which radium emanations were diffused, soon became flabby and dull, and in six or seven days their breathing became troubled and their skin showed want of freshness. These symptoms became more and more accentuated up to the thirteenth or fourteenth day, when they died. Flakes from their skin floated in the water, and on being taken out of the vessel it was found that their skin was partially decomposed and their blood was abnormally dark in color.

The larvæ of insects, and notably of caterpillars from the corn butterfly, when enclosed in a glass tube containing a small portion of radium become paralyzed in twenty-four hours, and usually die within forty-eight hours afterwards.

To those who are waging a crusade against disease and the causes that lead to it, the discovery of this property of radium

will be most welcome news. Very recent experiments by scientists like Caspari and Aschkinass indicate that bacteria and microbes in many cases when exposed to the action of radium rays are killed outright, while in other cases their development is seriously retarded.

Several cases of cancer have been treated with radium with beneficial results and one or two cases have been reported permanently cured. Radium has also been found beneficial in the treatment of consumption and bronchial diseases, but thorium, which has a slower emanation besides being much cheaper, has been found far better. Five minutes' application of radium would be nearly equivalent to ten years' application of the same weight of thorium. The best condition for the free escape of these emanations, so that they can mingle with the air the patient breathes, occurs with both radium and thorium compounds when they are dissolved in water.

It is said that an hour's inhalation from one hundred grains of dissolved thorium nitrate will produce no injurious effect. A few milligrams of radium bromide is placed in a large dry bottle when radium is to be used, and water is drawn in to dissolve it and all openings are closed which communicate with the outside. For first trials only a few bubbles of the gas generated in the large bottle are drawn into the lungs and retained as long as possible. This treatment is repeated once every twenty-four hours with only a very gradual lengthening of the time of the process with each repetition. With such a treatment properly administered by a skillful physician, it is claimed that consumption may be permanently cured. Radium has also been tried as a remedy for the cure of blindness, but thus far the results have not been very encouraging.

In conclusion I will say that many speculations have been indulged in as to the future use of radium, but from the present outlook it would seem that its widest field of usefulness will be in medicine. In that direction vast possibilities await its application if only it may be found in larger quantities than at present, and some cheaper mode of manufacturing it is discovered than the one now in use. Until then the uses to which radium may be put must necessarily remain very limited. Those who think

that radium can never be manufactured at a reasonable price should recall to mind the difficulties that attended our early efforts to separate aluminum from the elements found associated with it, and the prediction which was made then that "aluminum could never be manufactured cheaply enough and in sufficient quantities to make it of any commercial value." We have all lived to see aluminum manufactured at reasonable rates and have found aluminum ware on the market at a price within the reach of everyone. Who knows but what ten years hence the same will be true of radium, and that we may find its compounds on the shelves of every drug store in the country! I am not a dreamer, nor an over-zealous enthusiast, but I believe that there is yet a bright and brilliant future for radium, and that the time will come when we will be startled at the many uses to which radium may be put.

To a Friend Left Behind

R. T. HOUSE

"Friendships and men grow feeble with the years."
Some cynic, sharp with disappointed love, or spurred
By itch of epigram, wrote this with sneers
On my blurred record book of Read and Heard.
Mayhap 'tis true; I thought so once; but stirred
Of late, through two long days of hopes and fears,—
The emigrant's companions,—by a word,
A glance, a touch, henceforth to eyes and ears
And touch of mine forbidden, I was glad
With a philosophy more kind and bright.
I thought of one who filled a summer's dearth
With love's rich harvest ripened in a night;
And if I could not alter, I could add,
"Friendships, not men, are beautiful at birth."

Preparation for History Teaching

M. A. CARRINGER, TIONESTA, PA.

OF all branches in the public school curriculum there is no other so poorly taught as the history of our own country. This is the case even where the teacher is otherwise well equipped. It is not uncommon for public school teachers to present the French and Indian Wars as facts strictly American, to teach that Thomas Jefferson wrote the Declaration of Independence, or to consider the War of 1812 without any reference to contemporaneous events in Europe. Historical phenomena are presented as isolated facts, foreign relations are misinterpreted, and underlying social and economic causes are ignored. The child is thus given false or partisan views of facts, and the very courses which are to prepare him to deal with problems as a citizen have an effect exactly opposite to the one sought. This defective teaching of history grows out of the fact that teachers in the common schools have no adequate knowledge of the subject. To teach an historical fact in its proper relation and in proper perspective demands a knowledge vastly wider and more profound than is given in the common school text-books, or even in the historical courses of the normal schools.

In the first place, the teacher must have a somewhat extensive view of the political history of the world; a view of the ancient empires, a somewhat more extended knowledge of the history of Greece and Rome, and a yet more extended knowledge of the history of France, Germany and England, including the events leading to the formation of the modern European states. There is not a phenomenon in American history which does not take its rise far back in the history of Europe, and which does not go to these sources for its explanation. Events in America in the period preceding the Revolution are usually concomitants of larger movements in Europe; in fact, our

Revolution itself was only a part of a widespread reactionary movement in Europe having its springs in the ideas of the French Revolution. Such a knowledge of political history will prevent the teacher from presenting American institutions as if they had sprung full formed from the brains of the fathers of our government; it will further enable the teacher to give to events their due importance, and to place them in proper perspective.

Second in importance, I would demand a knowledge of the history of governmental institutions. The teacher should know that the genesis of modern constitutional government is found in the dawn of history; that the American republic is a product of ages of experiment in government; that individual liberty and local self-government were wrought out in the travail of centuries. The framers of the American Constitution had before them as precedents the record of the Grecian republics, the consulship and the senate of Rome, the history of the Venetian republic, the Magna Charta of King John, the long record of constitutional government in England, from the assemblies of the people among the ancient Angles and Saxons to the representative parliament of the eighteenth century. The constitutional convention was also deeply impregnated with the political ideas of the French Revolution of 1789, and the English Revolution of 1688. Our founders took advantage of the vast wealth of experience accumulated by other peoples who sought for free government. Looked at from this point of view, American governmental institutions appear as a consistent part of the world historical order; they present themselves to the mind as the logical and natural result of certain clearly defined world movements. All elements of novelty or chance disappear, and the American government takes its place and finds its explanation in the order of cosmical evolution.

Not only should the teacher know government genetically, he should also be conversant with the principles of constitutional law as it exists at present. He cannot inculcate broad and intelligent views of the duties of a citizen without such knowledge; neither can he understand such periods as that of the Confederation or that of reconstruction. The problems of these periods

are largely constitutional. Neither can he form an intelligent opinion on the various political questions arising in the course of our history if he does not understand the workings of our governmental machinery.

Co-ordinate with constitutional law and history, I would place a knowledge of international law and the history of American diplomacy. The causes of our War of 1812 and the Spanish War can only be understood in the light of the principles of international law. The questions relating to the seal fisheries, the Oregon and the Alaskan boundaries, the recognition of the Southern Confederacy as a belligerent power, and the annexation of foreign territory also belong to the same category. At least an outline view of the powers and duties of American consuls, ministers, and ambassadors and the history of our diplomatic relations with the great powers of the world is essential to any just comprehension of our place as a world power. Add to the facts and principles here suggested a knowledge of the constitution and workings of the state department and the student is in a position to understand most of the questions growing out of our foreign relations.

Next, I would demand of the teacher a knowledge of the elementary principles of economics. In its origin history was purely chronological; later it became a narrative of the deeds of kings and armies; but in modern times it lays great emphasis upon the industrial development of the people. Frequently, events which on the surface are purely political in their nature are produced and controlled by deeply underlying economic causes. Nearly all the great political issues, as tariff, money, and the trusts, are essentially economic problems, and cannot be understood save in the light of economic principles. Many of the events connected with the Revolution and the Rebellion cannot be understood without a knowledge of the history of the financing of those wars.

Lastly, I would demand that the teacher be a student of the philosophy of history, so that he may be able to grasp the broad world movements of history, and form some judgment of the trend of events in our own land; that he may learn to look for something more than the proximate causes of events, and

put each historical phenomenon in its proper place in the world movement to which it belongs. Then will history become for him a grand onward movement, and triumph of principle, in which justice, individual liberty, local self-government, government by representation, government by and through law, slowly but no less certainly overcome slavery, despotism, and wrong. Though in turmoil and revolutions, empires rise and fall, yet a principle once wrought out remains to reappear in new systems. Here he will discover that inevitable laws of causation are at work; that each event is produced, not by chance, but as a part of a vast, all-inclusive order of world development.

To all of this, I would add as wide and exhaustive knowledge as possible of American history itself, and a wide reading in American biography, so that he may be able to mingle with his teaching the personal element which makes such a strong appeal to the youthful mind.

This is a large demand to make of the overworked and poorly paid teacher of the common schools, yet I cannot conceive how an event in American history can be presented in proper perspective and in its right relation without at least the outlines of these facts and principles. In political history an elementary general history will furnish the outlines which may be filled in as time will permit by readings from Mommsen, Gibbon, Guizot, Motley, Green, and other standard historians; in constitutional law, constitutional history, international law, American diplomacy, economics, and the philosophy of history, one elementary text-book in each subject will suffice to give a general view of the field; in American history and biography, Parkman, Prescott, Roosevelt, Irving, Fiske, the lives of Washington, Lincoln, Grant, Lee, Sherman, and other celebrated Americans, read like romance and can take the place of the desultory reading which nearly all teachers do. I would not, however, have the teacher become a specialist in history; this course can be carried on in connection with the other studies of the teacher, being given only its proportionate time. Thus the teacher, by a course extended over a series of years, may acquire a knowledge of history of constantly increasing breadth and depth.

The Professional Culture of Teachers after They have been Regularly Employed in School Work

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THIS paper is tentative, and it is designed to call attention to the mental attitude of a large class of teachers after they have been regularly employed in school work, and have practically ceased to study educational problems seriously, or to widen their spheres of knowledge by systematic methods of culture. It is assumed that teachers who cease to strive after higher ideals in self-improvement are moving with an accelerated velocity down an intellectual incline. This furnishes the background for submitting some reflections on the composition of the teaching force of the United States.

In his last report the Commissioner of Education gives the whole number of public school teachers employed at 449,287. Of this number 117,035 are men, and 332,252 are women. The same table shows that during the last twenty-two years the percentage of male teachers had steadily decreased throughout the country from 42.8 per cent to 26 per cent, and that the annual decrement of male teachers in the five great divisions into which our country is geographically subdivided is about 5,000, and the annual increment of female teachers is 15,000. In 467 cities included in the Report of the Committee on Salaries, Tenure, and Pensions of Public School Teachers in the United States, page 53, it is shown that the number of teachers employed was 84,042 exclusive of supervisors, and that only 8.6 per cent of the entire number employed in high and elementary schools were men, but deducting 2,921, who are principals, from the total, leaves 5.6 per cent of male teachers in these high and elementary schools. These partial statistics

are introduced for the purpose of calling attention to the character of the teaching force to be influenced by any system that may be devised for their professional improvement. It is my conviction that there is no marked difference between the sexes in regard to any innate or acquired disposition to study thoroughly educational problems, or to strike out on new lines of investigation. In a rough sort of a way, I am inclined to the belief that not more than twenty per cent of either sex now engaged in educational work is willing to do much in the direction of either persistent study along special lines or professional reading. By this I do not affirm that eighty per cent of the teachers do not read, but that their reading is of that patchy, scrappy, miscellaneous species that contains neither information nor much literary culture. The disinclination of a majority of teachers to engage seriously in new channels of thought, unless under pressure of a present, powerful stimulus, is well known. Consequently, this negative factor has to be reckoned with in all calculations connected with an investigation of this kind.

When "teachers' reading circles" were first outlined in several of the states and courses of study rather formidable were recommended, covering three or four different lines of work, it was very generally believed that a plan had been hit upon that would materially raise the general level of the professional efficiency of the teaching force of the country, and thus widen their spheres of knowledge in many directions. In the practical application of this elaborate scheme, it soon became apparent that those who should have accepted it most enthusiastically rejected it or were indifferent, while the younger and more enthusiastic teachers were incalculably benefited.

There is another class not so numerous as the first, that had their minds set in another direction. They are the "degree hunters" who are specializing. They are high school and elementary teachers who are looking forward to something better than they now have, and are striving each summer at normal schools, colleges, and universities to improve themselves in certain branches of study in order to receive higher salaries. Work of this kind has great value academically, but in general

it does not lead very far in the direction of professional study, and consequently contributes little to expert teaching. The knowledge acquired is chiefly technical and narrow, and it leads into closed alleys rather than out into the open. Yet, there are some exceptions. My observation in watching high school teachers who have taken work along special lines is, that it narrows rather than broadens their vision of educational questions generally. As a class, these teachers give much less thought to scientific methods of study pertaining to the acquisition of knowledge than any other class of teachers. They are drill masters who continue to fit subjects to boys and girls, rather than fit boys and girls to subjects. Their methods are in an advanced microscopic stage. In hardly any sense can they be classified as students of education, but they are excellent drill sergeants.

If eighty per cent of teachers cease to read systematically after they have been once thoroughly installed as teachers, the question is, how can they be induced to fall into studious habits of reading and investigating educational problems? A temporary stimulus may be imparted by having a graduated course of study, the pressure of which is in some manner connected with an advance in salary. A purely financial stimulus is a low motive for real teaching. But there is a tendency inherent in some minds, while working at a project that is irksome at first, to become interested in the kind of work which was so distasteful at the beginning. This change is produced by a different view-point. However, there should be nothing compulsory connected with any scheme for the professional advancement of teachers, but it should be of such a nature as would enable one to pull himself upward by self-exertion.

A danger to be guarded against in the use of all factitious stimuli is the shortness of the time occupied in preparation for advancement. Many never look ahead very far. The near and the present they see. In general, the minimum salary should be large enough to allow those who reach it and feel inadequate to further exertion, to rest there and vegetate, having their thoughts undisturbed by visions of future examinations; but for those progressive spirits, actuated by a great

desire to do much better work and to cultivate their minds to the greatest possible extent, a way should be left wide open through which to advance in proficiency each year.

By a well-known law in operation among skilled laborers, it is a recognized fact that the best workers always lift up to a certain level those who have not will power enough to lift themselves. The strong workers help the weak ones to better salaries. A method of dividing teachers into groups for the study of special subjects has been quite successful in some cities. Frequently one enthusiastic teacher in a school of twenty or thirty teachers will inspire from one half to three fourths of the entire body. Sporadic efforts are generally short-lived. Enthusiasm is contagious, but it is not equal to well-directed, persistent discipline. A disciplined mind counts everywhere.

If the superintendent of a system of schools or the principal of a school is studiously inclined, the teachers, as a body, can be put in the right attitude toward professional advancement. The superintendent or principal must be a leader, one who can persuade others to enlist under his banner. The organization of the workers first into a compact body, those who really mean to improve, will produce a marked effect on the laggards.

I have made it a point whenever I read a new book, or an old one that I found to be helpful, to call the attention of principals and teachers to it publicly and to speak briefly of the leading thoughts it presented. I have tried to create a desire for knowledge first that some of the teachers would endeavor to gratify. In all that is done, the taste of each individual must, to some extent, be consulted. He should be urged to go out and browse in such pastures as seem most inviting to him. Next to one's professional reading, after thoroughly informing himself in regard to the subject matter which must be taught and its connection with other related subjects, he should study most thoroughly the principles of education and the history of the processes by which each mind made its discoveries. To secure the best results each one should pursue some subjects that are quite remote from his daily routine of work. The mind that is not continually making some new acquisitions is decreasing in power as well as in mental alertness.

To keep all the teachers of a corps growing in knowledge as well as in efficiency is one of the most urgent unsolved educational problems in our country at this time, and I trust some practical scheme will be presented at an early date in which this subject will receive the treatment its importance demands.

Educational Courses in German Universities

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I HAVE just read in the October number of EDUCATION the review of M. Fouillée's book on the professional training of teachers in Europe; some statements in the review seem to me likely to cause misapprehension as to the courses in education given in the German universities. I am, therefore, moved to submit some facts which throw light upon the matter. There are no doubt many students of education in America who are inclined to look toward Germany for advanced work in their subject; to such persons the data which follow will be of interest.

In 1903 I had occasion to make careful investigation of the courses in education in the German universities; I examined all announcements for three semesters, beginning with the summer semester of 1903. I found no considerable variation in the general condition from semester to semester, and hence offer the data of the summer semester of 1903 as fairly representing what one may expect at any time.

The information is taken from the officially recognized *Deutsches Universitätskalendar* edited by Dr. Ascherson, and published at Leipzig.

SUMMER SEMESTER, 1903

Berlin.—One honorary professor of pedagogy; three courses of one hour each. (Paulsen, the distinguished philosopher, lectures on pedagogy upon occasion, but gave no course this semester.)

Bonn.—One honorary professor; one course, two hours. *Gymnasialpaedagogik.*

Freiburg i. B.—Two lecturers from higher schools, with no university rank indicated; three courses, two of two hours each, one not specified.

Giessen.—One course on history of pedagogy, by a professor of philosophy.

Göttingen.—One course, one hour per week. Also the remark, *Pädagogisches Seminar vacat!*

Greifswald.—One course, pedagogy, two hours by a professor of philosophy.

Halle.—One honorary professor, two courses of one and two hours respectively.

Heidelberg.—One course, two hours, by an honorary professor, also lecturing on ancient philology. One course, two hours by a Gymnasium Director.

Jena.—One honorary professor, two courses of two hours and a pedagogical seminary. One *Privat-docent*, one course of two hours.

Kiel.—Only the remark, *Pädagogisches Seminar vacat.*

Königsberg.—One course of one hour ("Herbart's pedagogy") by a *Privat-docent*, who also lectures on philosophy.

Leipzig.—One extraordinary professor ("Assistant professor") of pedagogy, giving one course of lectures, two hours, and conducting a "practical pedagogical" seminary, with the co-operation of two others who are apparently higher school teachers. One course of lectures, five hours, by a professor of philosophy, who also conducts a "philosophical pedagogical" seminary. [One academic pedagogical club.]

Munich.—One course, four hours, "Theory of gymnasial pedagogy" by a professor of classical philology.

Würzburg.—One course, four hours, by a professor lecturing also on history of Greek philosophy.

A few comments may serve to call attention to the points of chief interest.

First, only thirteen out of the twenty-one universities offer any courses of any sort on education; moreover, the significant remark found in two announcements, *Pädagogisches Seminar vacat*, suggests that the tendency is not toward more but rather less work in education; I have no definite information upon this point.

Next, a student seeking full work in education could be provided for at only two universities, on the most liberal estimate, namely Leipzig and Jena; even by taking all courses offered at Jena he would have only six lectures a week, and a seminary; of course the seminary could be depended upon to furnish employment enough to take up any time left from the lectures.

Next, several points should be noted as to the courses and the teachers; in the first place there is, so far as I can discover, no regular full professor of education in any German university; the lecturers are either honorary professors, that is, without salary, or men from the higher schools who come in and give one or two courses on pedagogy in the university, or finally in the single case of Leipzig, an assistant professor. The foregoing refers to the professors of pedagogy; in some cases it will be seen that full professors of philosophy or philology lecture also on education; even so eminent a man as Paulsen of Berlin does this; but such lectures are distinctly *Nebenfach*.

Again, the courses are largely historical and with the single exception of Jena, refer almost exclusively to the so-called higher schools; all honor is due to Professor Rein for devoting his energies mainly to the problems of the *Volksschule*.

Jena and Leipzig, then, are the two universities which can offer to a student of education enough work in his own subject to keep him busy; but there are considerable objections to both of these places. Leipzig, as above intimated, emphasizes the special pedagogy of the German higher schools to such an extent as to make the work less valuable to the American student. Jena is so completely committed to Herbartianism as to lay it open to serious suspicion of one-sidedness.

The above facts seem to me to make it clear that an American student would hardly be justified in going to a German university for the courses in education alone; if with these courses he wishes to combine other university studies, philosophy for example, or if he desires to make a study of German education or life, he can easily find full employment for his time and strength.

German Secondary Education

ARTHUR MARVIN, SCHENECTADY, N. Y.

THE secondary institutions of learning in Germany are generally distinguished from the primary and the higher schools by having the adjective "höhere" prefixed to the name of the school, just as the prefix "hoch" indicates a higher institution of learning. Thus a "Handelsschule" is a primary commercial school, ranking with and resembling the commercial continuation schools; a "höhere" Handelsschule is a secondary or "higher" commercial school, and a "Handelshochschule" is a commercial high school, ranking with the higher institutions of learning, like the technical high schools and universities.

A word is necessary in regard to the peculiar influence exercised by a military regulation of the country upon secondary education. Provision has been made by the army organization that all German youths who have successfully completed a course in a six year secondary school, or six years of work in a nine year secondary school, shall be honored with the privilege of one year's military service as a volunteer, instead of a service of two, or, in certain cases, three years of regular service; and in addition shall have opened up to him an opportunity to become an officer in the German army. The desire to acquire this privilege undoubtedly induces large numbers of young men, as well as their hopeful parents or advisers, to make great financial sacrifices in order to secure the completion of six years of work in a secondary school. This qualification having been attained, it is a much deplored fact that large numbers of students withdraw from nine year schools without completing their work, which only too plainly demonstrates the real aim in this secondary study. Yet this provision cannot but be designated as an extremely politic and wise means of raising the educational standard of the people, and of supplying a large choice of mentally well-equipped young men from whom to recruit the lower ranks of army officers.

At the attainment of the tenth year the child destined for a better education, either secondary or higher, enters some secondary school. These schools are either classical, semiclassical, or nonclassical, according as both Latin and Greek are taught (classical), or but Latin (semiclassical), or neither Latin nor Greek, modern languages taking their places (nonclassical). These secondary schools may have either nine year or six year courses. The nine year schools are called Gymnasien (classical), Realgymnasien (semiclassical), and Ober-Realschulen (nonclassical). The six year schools are called Progymnasien (classical), Real-Progymnasien (semiclassical), and Realschulen (nonclassical.)

The Realschulen are of comparatively recent development, their history going back only about fifty years. Their rise was contemporary with the commercial movement in Germany, and they have experienced their greatest development, as have German commerce and industry, during the last few decades. Though bitterly opposed by an unreasonable and fanatical prejudice on the part of the philosophical adherents of the ancient classics, these schools, on the sheer strength of their merits, have won their way to the front, aided, also, in no mean degree, by the farsighted and broadminded commercial policy of the present Emperor, who has bestowed on them his unconcealed favor. To-day they offer an excellent opportunity for a broad and practical education as a foundation for a business career. It follows from this that the young man who seeks to enter some commercial or industrial career, or who intends to complete his education in some industrial high school, will attend in his tenth year, as a rule, a secondary nonclassical school, either the Ober-Realschule or the Realschule.

If the means at the disposition of the student are limited and he must end his educational career in the secondary schools, he has three general courses open to him. He may enter some secondary trade school, usually with a three or four year, or, less frequently, with a two year course. He may choose a six year course in a Realschule or Real-Progymnasien, or a Progymnasien. Or, if he can afford a longer course, he may enter a nine year school. Since a lack of funds to secure an

advanced education generally implies a necessity to earn one's own livelihood, the father or adviser, if he is wise, will probably send the son to a special trade school of secondary rank, or to a Realschule or Ober-Realschule instead of permitting him to cram into his head what to him are useless rudiments of Greek or Latin.

Since the "real" schools are not industrial schools in the true sense of the term, but supply rather a practical preparation for an industrial career, it follows that the German system of industrial secondary education touches the system of general secondary education solely through the secondary trade schools, such as the higher schools for the textile industry, higher engineering schools, higher institutes of technology, higher commercial schools, etc.

Attention may be called to the fact that the secondary schools, as a rule, close the educational career of German girls, though to-day sentiment is rapidly growing in favor of their admission into the higher institutions of learning, which in a number of instances has already been accomplished. In the universities they are generally admitted as "Höhrer," if not as full students, in which case they are privileged to attend prescribed courses of lectures. The same is true of technical high schools, where courses like economics, history, industrial art, etc., are open to women. Since the girls who attend secondary schools are compelled to prepare themselves for some industrial occupation much less frequently than are the boys, more of them attend classical or semiclassical schools than "real" schools or secondary industrial schools. However, Germany has already made considerable provision for secondary industrial schools for girls, and is to-day busily engaged in increasing their number.

If the boy of ten is destined for a higher education, he has two general classes of schools open to him—the schools with nine year and those with six year courses, and he may choose either a classical, semiclassical, or nonclassical course. During the earlier years of the nonclassical "real" schools, prejudice in favor of the classics and a solicitude for the prestige of the higher professions of medicine, law, and theology withheld

from the nonclassical institutions the privilege of being preparatory schools for these professions. But with the rise of modern commercialism and the revolt of public opinion in favor of a practical education the "real" or scientific schools forced from the state, one after another, the privilege of being numbered among the preparatory schools for law and medicine, and in some cases, also, for theology. Since by nature theology calls for a classical preparation, the latter privilege, where granted, was merely a nominal recognition of no importance.

If a boy of ten and his advisers dream of theology, the boy will very likely enter a classical or semiclassical school with a nine year course. If he looks forward to medicine or law, he will probably select a semiclassical or nonclassical school. If he anticipates an industrial or commercial career, as manufacturer or merchant, he undoubtedly, in the great majority of cases, chooses an Ober-Realschule or Realschule as a preparation for a higher education in some industrial high school. Whether in the latter event a nine year or a six year course is chosen will depend upon the adviser's ideal of an industrial education. Some contend that the boy must needs come in contact with active business life while receiving his industrial education, and not be totally confined to his books until he has completed his entire educational preparation. Those who entertain such a conviction will send their sons to a six year course Realschule, and after graduation, when he is about sixteen years old, will have him go out into business for two or three years, frequently to complete a period of apprenticeship in some profession, and then send him to an industrial high school to crown his preparation. In recognition of this practice the industrial high schools have almost universally provided in their entrance requirements that graduates of a secondary school giving a six year course shall, in addition, have completed a period of apprenticeship, or have had several years of practical experience in some business. If the advantages of an intermediate brief practical career have not been had, the boy who is bound for a higher industrial education must needs attend a nine year course school—that is, an Ober-Realschule, or, less frequently, a Realgymnasien or a Gymnasien.

The average age of the student who begins work in some higher institution of learning is probably nineteen or twenty years. The student who contemplates entering the medical, legal, or theological profession, or who desires to follow some higher intellectual pursuit, enters the proper department in some German university, after having passed through some secondary school, as already indicated. Young men who are aiming at an industrial career to fit them for the ranks of miners, merchants, chemists, architects, engineers, scientific agriculturists, or government officials, enter some industrial high school, such as a mining academy, commercial high school, or technical high school. The technical high schools invariably contain a number of closely correlated departments for architecture, engineering, machine building, electrotechnics, chemistry, general science, etc. The student here specializes in his profession. Up to this time the student has been preparing himself for a professional education, in that he has laid a broad foundation of general practical knowledge—the great mission of the Realschule. During every day of his work in the commercial high school or the technical high school the student is putting on the best armor that modern professional education can provide, and is receiving the benefit of instruction in the most advanced technical thought that science and persistent application have developed.

The Educational Reforms of Frederick the Great

PROFESSOR SAMUEL WEIR, PH.D., MITCHELL, S. D.

WHEN Frederick II. became King of Prussia in 1740 he surprised the ministers of his kingdom by making it known that he would consider the interests of the people and those of the king identical, and that, in case a difference of interests should arise, he would deem it his duty to serve the people. He immediately began to correct the abuses which had resulted from the arbitrary and eccentric administration of his father. He reorganized the army and improved the methods of military discipline. He appointed ministers for commerce and manufactures, and he faithfully sought to develop and organize the industrial possibilities and forces of the country. Educated under French influences, he was an embodiment of French "free thought," and he recognized the right of his subjects to freedom of opinion, believing that truth does not need the support of persecution, but is always sufficient in itself. In short, he made it his delight to rule over an honorable, self-respecting people; a people with power and freedom to think and to act for themselves, to speak or to write freely, to conquer by the force of their manhood, or, if need be, to perish in their devotion to their king and their fatherland. He argued that "superstition, religious despotism and impatient interference hinder the development of talent, while freedom to think elevates mind and heart." By means of economy and practical wisdom, moreover, Frederick succeeded not only in supporting the vast military enterprises of his reign, but also in carrying out extensive public improvements, and increasing in a large measure the general prosperity of both the people and the government.

On the conclusion of the Seven Years' War, by which there was secured to him the whole of the Province of Silesia, which had been won in the earlier war of the Austrian Succession, Frederick set about repairing the damage that had been caused

by the terrible ravages of the long conflict. He took the supplies of grain that had been gathered for the support of the army and distributed them among the people for food and for seed with which to plant new crops. He also furnished horses to the farmers. All the money that could be saved from the public revenues by dint of rigid economy was expended in restoring the regions that had suffered most from the devastation of war. Yet more important, however, were the measures which Frederick adopted for the enlightenment of the people themselves. In his efforts to promote education he aimed, as in other respects, to be the father of his people, giving his commandments, it is true, in an arbitrary manner, but ever keeping the welfare of the people in mind.

In the year 1763 Frederick issued a general school order, which had been prepared by Hecker, a broadminded and enthusiastic educator, with the purpose, as declared in the document itself, of "establishing education in the rural districts throughout all our provinces upon a better basis than has heretofore existed." As might be expected, the school order of 1763 laid great stress on the practical side of education. But Frederick was aware that utility could not be attained without solidity, and he therefore determined that the methods of the schools should be adapted to the cultivation of the understanding and the development of independent thought. The methods of instruction which had been in vogue, especially in the Catholic provinces, where education had long been under the control of the Jesuits, appealed mainly to the memory. Frederick believed that thoroughness and independence could not be attained by such methods. Moreover, education could not be practical in the best sense of the word if it did not arouse a sense of the dignity and the worth of manhood. Men should be recognized as men and treated as such, irrespective of their rank in society. Thus, while practical results were not lost to view, "humanity" was at bottom both the end and the foundation of education.

In spite of his own rationalistic tendencies, Frederick believed in the necessity of religious instruction for the common people. The people, he argued, need the definite restraints and sanctions of religious faith in order that they may properly fulfill

their obligations and perform their function in society. Accordingly, the schools were to be opened with a song, followed by a prayer led by the teacher and ending with the Lord's Prayer, the Scripture lesson for the day, and a portion of the catechism. Then followed the program of studies for the day, but religious exercises again preceded the afternoon program. The New Testament, moreover, was an essential part of the curriculum of studies.

Notwithstanding his predilections in favor of the French language and literature, Frederick believed that the children should be trained in the use of the vernacular. He justified his own preference for French on the ground of the alleged crudeness of the German language and the imperfection of German literature in his day; and it must be acknowledged that there was justification for this position. The dawn of the classic age of German literature had not yet come. That dawn came indeed only with a revival of the ancient classic spirit and the putting away of French idols; but Frederick, while still aping the French philosophers, and ambitious to shine as a philosopher himself, was not slow to recognize the value of classic training in the schools. In fact, with reference to its educative value, he definitely placed the French literature after the Latin and the Greek. With respect to the method and aim of classic instruction he was distinctly humanistic. Latin should be taught for the sake of the style and the content of the classic writings, and not for the supposed educative value of mere routine drill in grammar. Instruction in literature should aim at the cultivation of taste and style—an end which can be best attained by a direct study of the classic writers themselves. Finally, Frederick appreciated the value of the classic spirit and classic models in the growth of German style, and he urged the translation of the ancient classic writings into German for the sake of their influence in the cultivation of German literature and German literary taste.

In addition to language and literature, Frederick favored the study of mathematics and history, but in these studies also he insisted upon a method that would call the understanding into activity.

According to the order of 1763, the school age was to extend from the fifth to the thirteenth or fourteenth year. Parents were forbidden to take their children from school until they were able to read, had at least made a beginning in writing, and had a good grounding in religious knowledge. A census of children of school age was kept, and all cases of prolonged absence from school were investigated. The parents paid school fees for the education of their children, but the poorer children were aided by contributions from the general charity fund. The pastors and priests in the various parishes were required to make frequent visits of inspection to all the schools within their jurisdiction and to report the results of their investigations to their superiors, who were in turn expected to make tabulated reports to the government. The pastors were also to give counsel to the teachers as to the best methods of instruction and school management.

By the order of 1763 only such teachers were to be employed as had proved their qualification on examination, or at least such as had the approval of Councillor Hecker; but it was impossible to supply the schools with properly qualified teachers. The compensation was so small that most of the teachers were obliged to supplement their scanty income by engaging in some additional occupation. So extensive did this practice become that the government was obliged to place restrictions upon the teachers with respect to their choice of collateral occupations.

To supply in some measure the need for schoolmasters, and to obviate the necessity of allowing school keeping to become a mere adjunct to some other occupation, Frederick favored the appointment—at least as a temporary expedient—of invalided soldiers as school teachers. He took the precaution, however, to make it a condition of their assignment to the task of teaching that they should know how to read and write and make arithmetical calculations. The government was obliged to support these retired veterans, and it was considered good economy to turn their remaining energies to account in school keeping. But the Cultus Minister, Von Zedlitz, perceived that such a plan would prevent the development of an independent body

of self-respecting teachers devoted exclusively to their profession, and he accordingly opposed the position taken by the king. But Von Zedlitz was forced to yield to the exigencies of the time. The situation could be permanently relieved only by training a new generation of teachers, who should devote themselves to their work as to an honorable calling. There were already several seminaries in existence, but these were occupied mainly in supplying teachers for secondary and higher schools. Some time had yet to pass before the wholesome idea of professional training and adaptation could be realized in respect to teachers in elementary schools.

On another question, also, Frederick's views were too conservative to meet with the approval of his minister. In the year 1708 the Pietist Semler established a "mathematical and mechanical Realschule"* in the City of Halle for the practical training of boys in mathematics, mechanics and agriculture. This school was soon afterwards disbanded, but the principle which it represented took root and grew until, at the close of the nineteenth century, it threatened to overshadow all other principles of education in Germany. In 1747 John Julius Hecker, to whom reference has already been made, established in Berlin the first permanent and successful Realschule. Hecker's purpose was to found a school for children of the middle rank where practical training could be given to boys who were destined for mercantile pursuits. No sooner was the success of this institution assured than other schools with a similar aim were founded in various parts of Germany. In 1773, Resewitz, who had founded a Realschule in Copenhagen, published a treatise on the education and practical training of the citizen, in which he contended for the superior advantages of modern studies. Influenced by the views of Resewitz, Zedlitz desired to have the Latin schools in the smaller cities transformed into Realschulen, or at least to have Realschulen established in addition to the Latin schools. He called Resewitz to his aid and gave him instruction to effect the

* Semler was the first to use the name "Realschule" to designate a practical educational institute as opposed to the Latin school. The name appears in a report published in 1739.

change; but this plan did not meet with the approval of Frederick, who insisted that the youth should learn Latin, and who desired only that the methods of teaching Latin should be improved.* Accordingly he gave orders that the methods of instruction should be reformed. The minister at once set about to effect the desired improvement, and although he met with much opposition the work of reformation was vigorously and successfully prosecuted.

While giving his chief attention to the reform of education among the middle and lower classes, Frederick did not forget the schools of the nobility. The general condition of the "Ritter Academies" was found to be satisfactory, but the instruction was not sufficiently practical to suit the king. He desired that the noble youth should be trained for practical efficiency in promoting the welfare of the kingdom. Consequently the instruction should aim at the development of mind and character. Logic should be studied as a support to reason, but no scholastic quibbling should be tolerated. Classic taste should be cultivated by a study of Latin and French authors. In short, it is evident from the reforms instituted in the Ritter Academies that Frederick desired to make the nobles his allies in building up his kingdom on the solid foundation of industry and morality, and the practical if not liberal education of the people.

The task of reforming and extending education which had been committed to the Minister Zedlitz was performed with unabated zeal. In the next year after Frederick's death he established a special pedagogical seminary in Berlin, and he secured also the appointment of an educational commission, to which was assigned the duty of managing school affairs independently of the church, examining candidates for positions as teachers, nominating the teachers, and superintending all institutions of instruction from the elementary village school to the university.

One of the most important acts of this commission was an edict (Dec. 23, 1788) requiring the examination of all candi-

*It is interesting to note that the present Emperor holds views directly opposed to those of his great ancestor. William II. has emphatically declared himself in favor of modern courses of study.

dates leaving the classical schools for the university. "All youth," so the order reads, "leaving the public schools shall first be examined by the school which he has attended, and a detailed certificate of his fitness or unfitness as determined thereby received." This certificate was to be presented at the university. The effect of this requirement was to bring about a closer understanding between the schools and the universities, and to introduce greater definiteness in the aim and methods of the higher schools.

But for the reform of the lower schools according to the wishes of Zedlitz, as we have seen, the means were wanting. He, however, frequently visited the schools in Berlin and in the provinces, and sought to secure the adoption of methods calculated to develop the understanding of the children, and to exercise them in the art of thinking independently. In a number of the greater city schools of Prussia he succeeded in bringing about a modification of curriculum and methods, according to the tendencies of the current philosophy and the new pedagogy.

The reign of Frederick the Great is significant, not simply because it laid the foundation for Prussian supremacy among the German states, but also because it marks the beginning of a remarkable development in the education of the Prussian people under the patronage and control of the state. It is true that the Reformation had introduced instruction of an elementary grade for the common people; but the reaction resulting from the Peasants' War of 1525, and the devastation wrought by the Thirty Years' War, had left the peasants in ignorance and neglect. The Latin schools of the towns, moreover, had to a large extent lost contact with practical life. To provide instruction calculated to enlighten and to educate the poorer children, and to make the schools of the towns more practical by making them more effective in developing mental capacity, and thus to enrich his kingdom by enhancing the worth and the power of its manhood, was an undertaking not less worthy of a great ruler than the extension of his boundaries by warfare, or the strengthening of his prestige by wise diplomacy. And so, we think, Frederick himself believed.

Notes from Greater New York

The athletic girl will soon become a feature of the public schools of this city. The splendid success of the Boys' Athletic League, as exemplified by the improved physical conditions of the thousands of schoolboys here, has impelled its promoters to extend its benefits to the girl scholars of the metropolis. As a result, a Girls' Branch to the Public Schools Athletic League has been established. It has the support of every educator in the city, as well as that of a number of society women, and thousands of dollars have already been pledged toward its maintenance.

A well attended meeting of the Board of Directors of the new organization was held at the Hall of Education last month, and a number of excellent suggestions regarding the plan of the Girls' Branch were made. Before deciding definitely upon any system of games or method of physical instruction, however, it was deemed best to investigate the work that is being done for girls' athletic instruction in the public schools of the city, and also to prepare a list of the games that are being used with success in many educational institutions.

A splendid illustration of the interest that has been developed among the women who are interested in the new movement is shown by the fact that five hundred dollars was donated to the organization by a society leader who is bitterly opposed to girls playing basket ball and kindred games because she thinks it is immodest, but who is willing to stifle her scruples on account of the general good that is bound to result from the Girls' Branch.

"I don't believe in girls sprinting or playing basket ball," said the donor, "but I do think they should be taught to walk gracefully, and receive instruction in posing and Delsarte to give finish."

Another woman who is greatly interested in the physical training of her sex said: "The need for better athletic training among girls is here, and we have got to meet it. The great problem is, How are we going to regulate this athletic necessity after school hours? In our parks and in many gymnasiums girls are taking to athleties more and more every year. We want the influence of this athletic branch to be such that we can influence them to use proper and useful games, giving them something that will at the same time develop in them womanly manners and habits."

The speaker said further that it was a notorious fact that the

majority of the girls in the public schools did not know how to carry themselves properly, while many of them were on the verge of future physical defects simply for lack of proper training.

A committee was appointed at the last meeting held by the Board of Directors to investigate the entire question of proper games for girls and to report at an early date, preparing a list of games showing both the good and objectionable features from the physical, ethical and practical standpoints.

General George W. Wingate, who organized the Public Schools Athletic League two years ago, in discussing the achievements of the Boys' Branch with the writer, said: "It had its organization in the congested conditions of the city streets, which make it impossible for children to get any exercise in the streets. Twenty-five or thirty years ago children could play in the streets or in vacant lots. But at the present time there are no vacant lots, and the streets are so crowded with vehicles that it is dangerous for children to play in them. The result was that thousands of children did not get the exercise that a child requires to insure a healthy and vigorous body. Those interested in educational matters found upon examination that boys of the tenement house districts were far below normal in the matter of physical measurements, and that school children were growing up weaklings simply because of the lack of proper facilities for exercise.

"We therefore organized the Athletic League, and the fact that one hundred and forty-three thousand pupils participated in the competitions of the past year indicates what a success it has been.

"As a plain matter of fact, individuals who are interested in educational work are doing something that the city should do. We have hired athletic fields and armories, where the boys have their competitions, and we have given a button to each member of the League who has reached a certain standard of excellence in the matter of athletic performance. But in addition, the pupil must prove that he is well up in his studies, or he is not allowed to compete in the athletic events. Thus we discourage a mere striving for athletic prowess at the expense of mental growth.

"The city is now helping the movement by acquiring tracts of land to be utilized for athletic fields. When these are ready for use by the pupils we shall be in very good condition to proceed with the work.

"As a result of our work with the boys it has occurred to us that the girls should enjoy the same privileges. We found that the conditions which operated against the proper physical growth of the boys applied with even more force to the little girls. And so we started this movement for a Girls' Branch of the Athletic League.

"Wholesome, judicious athletics is what we aim to provide for the little ones, and it is absolutely necessary in order to provide the pupils with strong and healthy bodies with which to fight the battles of life."

Although but two years old, the Public Schools Athletic League is the largest organization devoted to physical culture in the world. President Roosevelt is its honorary Vice President. In a recent letter to General Wingate he heartily commended the objects and work of the League.

An agitation has been started this month relative to keeping the public libraries of the city open at night, in order that those whose hours of labor prevent them from attending in the daytime may be given an opportunity to do so when the day's work is ended. William H. Maxwell, City Superintendent of Schools, and many other prominent educators are heartily in favor of this scheme.

"The proposition of keeping the public libraries open at night," said Dr. Maxwell, "has my warmest approval, as would, indeed, any project for making available additional educational facilities for working men and women. There is to my mind no question that the closing of the large libraries at six o'clock exiles from their valuable collections hundreds of earnest readers who are employed all day long. If these readers could have time to go home and get their dinner, and then return to the library and still have two hours or more of time for reading in a quiet atmosphere, they would gain at once a golden educational opportunity, and also an open sesame to a realm of intellectual happiness.

"I am even in favor of having libraries open on Sunday. In this, however, do not understand that I would make them a rival to church-going, but I know that there are hundreds of people who do not go to church, and who spend their Sundays in undesirable surroundings, who, with a library of interesting books available, would spend their leisure moments in its quiet, orderly, educational atmosphere."

Teachers in this city are becoming more and more discontented over the large classes forced upon them. The majority of new school buildings contain class rooms with an average seating capacity of sixty. This number, the teachers declare, is altogether too large and makes discipline practically impossible, and individual instruction a farce.

Headed by one of the most efficient teachers in the city, Miss Ruth Granger, they are putting up a strong fight to have all future school buildings contain more class rooms, but with an average seating capacity of thirty-five.

In speaking of this new campaign, Miss Granger recently said at a banquet at which a number of this city's educational officials were present: "No matter how well paid the teachers are, no matter how artistic the buildings, no matter how elaborate the curriculum, it will never be possible for us to give back what we should until there are fewer pupils in each class for us to instruct. Let us unite in urging that the new buildings to be erected have less than fifty-eight, sixty or sixty-two desks in each room." This sentiment was greeted with applause by teachers and officials alike.

The advantages of small classes are being beautifully illustrated in the special school for backward pupils established here two months ago. In this school only fifteen pupils are in a class, and more work has been accomplished in the short time the school has been in operation than is done in the average class room in a term, despite the fact that the pupils of this school are all abnormally deficient. The individual instruction given to each, however, is working wonders, and the promoters of the school are satisfied beyond their wildest dreams.

It is now practically impossible to give each child a full day's schooling without large classes, but the officials are working with the teachers to discover a remedy for it. "Sky-scraper" schools is one suggestion that is looked upon with some favor. Its promoters declare that buildings ten to fifteen stories in height would accommodate double the number now registered in the average public school, and yet would allow smaller classes. Economy is another strong argument in favor of these schools. Although their seating capacity would be double, the cost of their sites would be the same as the schools now being built. The plan will be submitted to the Board of Education early this year.

In a recent lecture on "The Economic Importance of Trade Schools," Frank A. Vanderlip, ex-Assistant Secretary of the Treasury, and Vice President of the National City Bank, declared that labor unions and trusts are united in a tendency to make of a large percentage of the population commercial or industrial automatons, a tendency which the schoolmaster alone has the power to counteract.

"I am perfectly convinced that Germany's industrial successes and the comparative contentment of her population are in a very large measure due to her system of trade schools. Now I want to leave no confusion in your minds as to just what I mean by these trade schools. I do not mean the addition of manual training to the course of the public schools; that may or may not be wise, but the decision of that

question has no bearing whatever on the sort of schools I have in mind. I do not mean the establishment of schools to teach young men trades. I know that such schools have been open to much criticism from practical workers, and will meet much opposition from labor unions.

"It is the rank and file that I am considering, the privates of the great industrial army who have gone forth to the daily grind of work, taking with them such mental equipment as our school system has been able to give to youths of fourteen or sixteen years. I believe we need to establish for the members of this army a means which will aid them to gain a supplementary education along lines particularly adapted to their requirements."

The Board of Education established for the first time last September in two boroughs of this city two trade schools, whose object is to furnish the instruction indicated by Mr. Vanderlip.

C. T. H.

Editorial

THE interests of the college and university have grown immensely in recent years. In a decade, endowments have doubled. Laboratory and technical training have been both expanded and enriched. The points of contact between learning and life have been multiplied. Law, medicine and theology have no longer a monopoly as learned professions. The highest learning has uses on the farm and shop also, in trade and the arts. Thousands of young men covet learning as reinforcing labor. Industrial, economic and commercial interests have acquired academic meanings and reflective problems. The farm also, is a laboratory, and the office a place of far-reaching inquiry. Scholarly acquisition is seen to have more meanings than the so-called professional. The need for learning in the professions is not less; but, in economic industry, more. From the school-gardens of the little ones in cities and the serious study of soils and grains and cropping in rural elementary schools, through the manual and industrial instruction of the upper grades and the high schools, there is an evident and encouraging tendency to make doing thoughtful, to find a reason for the stored and disciplined mind, in the saner conduct and the more rational achievement. The college once put emphasis, undue emphasis perhaps, upon mere thinking—careful, accurate, scholarly thinking, 'tis true—but reflection unwedded to creative, regulative doing. This marriage of the highest learning to living is fairly modern.

THIS aggressiveness of the college makes new and unyielding demands upon the preparatory schools. The work that once fitted for college with entire satisfaction would be, in important respects, inadequate to-day. In not the subjects alone or chiefly is this change apparent, but in the way the subjects are used, the point of view from which they are studied, the results of their study, in habits of mind, the incident interests, personal efficiency and initiative. Among the most important of current educational problems are those that concern the schooling of youth in the adolescent years immediately preceding the college period. In part, this has come about through recent studies of the physical and mental and moral characteristics of nascent manhood and womanhood; in part, through the reflex influence of the changed and changing standards of the higher schools; in part, because of the new meaning of learning as applied to the arts of life, for those who do not advance to college training, the demands of almost every economic and industrial interest of the

day, for a higher type of efficiency, a more scientific and critical and masterful handling of the day's tasks and the great civic forces. The increasing social significance of labor and conduct, and wealth, and civic responsibilty, and the personal life, lays a burden upon the high school also, to furnish a better fitting for life to the thousands of young men and women to whom the high school is a finishing school.

JUST what the high school can do and ought to do in breadth of culture and technical equipment and preparatory training for the thousands who come to its doors, it would be difficult to say. School people themselves who have most studied the matter are not at one in their answers. But it would seem that among the reasonable results of four years of such study during the "teens," a typical American high school should (1) have laid the foundation for an intelligent recognition of civic responsibility as a personal contribution to society; (2) have developed to efficiency such native faculty as the pupil may have; and (3) have stimulated him to accept and be interested in an acquaintance with the great ideals which the race has worked out, as shown in the art and achievements and science and ethical standards which have survived. The sense of personal civic responsibility is vital if institutional life is to have an abundant and safe future. Personal efficiency, the ability and disposition to do some of society's needed service, and do it well and honestly and with interested consent, is no less valuable as one of life's assets. And the growth in a habit of regulating one's living in terms of the ideals suited to one's age and maturity, as these ideals appear in the unfolding of the race's activity, itself is an ideal that must serve to shape much of the work of these years.

THIS magazine stands distinctly for the improvement of secondary and higher schooling. Nothing that concerns college or high school training—equipment, teaching, faculties, ideals—is foreign to its pages. Elementary education is not less to be considered. Rural school problems very rightly have a large place in educational discussions. But the lines of social and industrial development in the passing generation give a new significance to the training of youth from fourteen to twenty years of age. College teaching has not always been intelligent; it is not so now, in all places. Much of it is yet perfunctory, sometimes blundering, often aimless or scrappy. Specimens of expert handling of college subjects are inspiring to those who really want to make the college the best possible instrument of training.

EDUCATION offers its pages to all who can contribute any real service toward improving the teaching of youth either in the secondary school or the college. It is a large field for both investigation and effort—one of the most important parts of the educational domain.

An admirable and in every way helpful contribution to the discussion of this problem of high school training was made by the National Society for the Scientific Study of Education, in its Fourth Yearbook, on "The Place of Vocational Subjects in the High School Curriculum." The report was made the basis for a serious consideration of several related topics at the time of the last meeting of the N. E. A. at Asbury Park in July last. It included statements of the place and present status of Commercial Work, Manual Training, Domestic Science, and kindred subjects in high school courses. The question of the Training of Secondary Teachers was not omitted. But of the nearly fifty specific lines of study upon which individual members of the society are engaged, less than half a dozen are given as directly concerned with secondary education. The report itself is admirable for the ground it attempts to cover, and is well worth studying by secondary teachers. Let it be said, however, that its value consists not so much in what it says, as in the spirit in which it is said, and the additional significant relations, suggested for fruitful consideration. Possibly, this compasses the purposes of the report. Certainly, it would fully justify its publication.

IN its efforts to teach the rising generation of farmers who contemplate migrating to the cheap lands of the semi-arid region of the central great plains what they can and what they cannot expect by adaptation of crops and the most approved methods of tilling the soil in the average of a cycle of years, the United States Government is doing a beneficent work. Under the general supervision of Prof. E. C. Chilcott, the government has experiment stations located from North Dakota to Texas, a thousand miles, and from the longitude of the James River valley west four hundred miles. Aside from the utilization of the underground water supply, we know of nothing so promising to that section of the West as the splendid educational work which the government has thus undertaken, to develop the resourses of the country along safe lines.

Few graduates of our agricultural colleges become scientific farmers, we have often observed in New England. Why? Because few become farmers at all. They seek the learned professions and more remunerative vocations. Indeed, one of our agricultural colleges in

New England has dropped its distinctive name and assumed the name of State University. In a recent tour of the states in the Middle West we discovered that, despite the fact that the farms have produced most of the wealth, even there the graduates of agricultural colleges are not content to make scientific farming their life work. Iowa at Ames, Missouri at Columbia, Kansas at Manhattan, South Dakota at Brookings, and Minnesota at the "Twin Cities" all tell the same tale. "Father," said one of these young men two years after he had graduated at Ames, and conscientiously tried to apply what he had learned, "Father, I can't keep my mind on the crops and the cattle and the chores." Utterly discontented, at last he won his father's consent that he leave the farm and study medicine. Are these young men at 21 or 22 overeducated for practical scientific farming? Minnesota has courageously answered in the affirmative, and has already established a school for boys aged 14 or 15, where instead of a high school training, they are taught the principles of scientific farming in a practical way. Herein, we believe, may be found the solution of a vexed educational problem.

Professors at Ames, Iowa, have had the cordial co-operation of the pioneer Chicago and Northwestern and certain other railroads in a campaign of education to give Iowa her preëminence as a corn-producing State. A railroad is none the less to be commended if prompted by enlightened self-interest when it provides special trains to enable such a man as Professor Holden to teach farmers how to test seed corn—to select ears of corn the kernels of which will all germinate, as well as those varieties of corn which, if all the seed planted grows and matures, will yield the largest returns. Iowa owes much of her prosperity to the co-operation of her scientific men and such railroads as the Chicago and Northwestern.

Foreign Notes

FRANCE

The beginning of the scholastic year in French universities is marked by formal addresses before the students and professors of each faculty on subjects related to their respective specialties. At the opening of the present term of the Paris University the Faculty of Letters under the presidency of the dean, Alfred Croiset, listened to an address by Professor Michaut on the spirit and method of literary studies. In the course of his address Professor Michaut dwelt at some length upon the persistence of erroneous notions with respect to the ideas of great authors and especially the ideas embodied by dramatic authors in their chief characters. Once started, these false conceptions spread rapidly and become so prevalent that we seem to take them in with the air we breathe and never think to question their agreement with the originals. The point was illustrated by reference to the general misapprehension of Molière's "Misanthrope," who is usually regarded as a martyr to noble ideals instead of an absurdly unsociable being. This is not the place to follow the critic in his analysis of this celebrated work; it recalls by its subtle discriminations those causeries of Sainte-Beuve which made criticism a fine art in France and imparted lasting distinction to the Collège de France.

The bill for the separation of Church and State has just passed the Senate and awaits only the signature of President Loubet, which will certainly be given. This measure puts an end to the annual appropriation from the public treasury for the support of religion which amounted in 1905 to 42,120,000 frs. ($8,424,000), divided as follows: Roman Catholic, 40,382,000 frs. ($8,076,400), Jews and Protestants the remaining 206,000 frs. in the proportion of one to seven parts.

The two faculties of Protestant theology, one at Paris, the other at Montauban, will also lose the State appropriation which amounted to 112,050 frs. ($22,410) a year. It is probable that the churches will do something to make up this loss.

The minister of public instruction in France has recently authorized the adoption in the public high schools and colleges of the new system of German orthography, the rules of which are stated in "Rules for Spelling German Correctly" (Berlin, Werdmann, 3rd edition, 1905). On and after January 1, 1909, any departure from this system of spelling will be rejected in the examination of French pupils. From 1906 all teachers will be required to conduct their classes in accordance with this order.

The question of the simplification of the spelling of the native language it is expected will soon be settled. As already stated in these columns two committees have had the subject under consideration. The first appointed by the minister of public instruction elected M. Paul Meyer as its secretary, and accepted two important modifications. The second committee was nominated by the French Academy, which was consulted by the minister in recognition of its position as the time-honored guardian of the French language. The conclusions arrived at by this committee reduce the need for reform to a few modifications of very little importance. The minister of public instruction has recently decided to appoint another commission, whose duty it shall be to make a careful summary of the work done by the two preceding committees of inquiry, and to examine the different learned societies in order to obtain a knowledge of their wishes on this question.

The chairman of this committee is M. Brunot, Professor at the Sorbonne, and among the members are M. Faguet of the French Academy, M. Gasquet, director of elementary education, and M. Rabier, director of secondary education.

ENGLAND

The resignation of the Balfour Ministry and the accession of the Liberals to power has an important bearing upon public education in England. In view of the certainty of some modifications in the law of 1902 the following extract from an article by Dr. Clifford, the famous Baptist minister, on the settlement of disputed points is of interest.

"We are encouraged," he says, "to hope that the people of England will obtain these three things: (1) popular control of State education; (2) the abolition of theological and ecclesiastical tests in the State teaching profession; (3) the exclusion of sectarianism of every type from the curriculum of the schools. "Let us have," he adds, "an *ad hoc* authority, such as is now demanded by writers in the Schoolmaster. Municipalize education on the broadest and most democratic lines. Abolish secrecy of management; bring the administration to the light of day. Let the people not only rule themselves through their freely and directly elected representatives, but also let them know all their representatives do, and how they do it."

The Prussian Minister of Public Instruction has completed an agreement with the Board of Education, England, for the interchange of young teachers intending to make a specialty of language instruction on the plan already in operation between France and England. Under this system the German intending to teach English in his country is attached for a definite period to a school in England and the English teacher of German goes under similar conditions to a school in Prussia. The plan has already proved very successful as carried out between England and France.

A. T. S.

Book Notices

First Science Book. By Lothrop D. Higgins. This little work, designed to serve as an introduction to scientific study, presents a thorough course in the science of common phenomena, and is a most admirable work for the purpose designed. It is somewhat surprising that such a book has not been before prepared; a place for it in the elementary schools has ever existed. The need of such a book is apparent; its use will prove of immense value to all teachers who have hitherto been forced to employ the regular and strikingly formal text-books in physics and chemistry when introducing their classes to these subjects. In this book the student will find many of the subjects that are already known to him treated in a manner which should explain the mysteries and clarify his ideas. Finishing this course, he should be well fitted to take up the science studies of preparatory schools, and should have a serviceable store of knowledge, whether or no he proceeds further in his school life. The book is in two parts, the first treating of physics, the second of chemistry. Under physics the subjects explained are Matter and Energy, Fluid Pressure, Motion and Force, Heat and Energy, Sound, Light, and Electricity; under chemistry, Outline of Chemical Study, Common Substances, and Common Chemical Processes. Following each section in the chapters are questions on the text that serve to test the student's power of observation and inference. While the subject matter is in strict conformity with the science of the topic, there is shown none of the dull and dry setting forth of it as demanded by the regulation text-book. Professor Higgins has with diligent attention written his book for the tyro and the progress is most carefully graded; constant appeals to the experience of the student are made so that he is never far astray from beaten or known paths. Considered either as a text-book for general study or as a supplementary book for reading and discussion, the volume is a needed one and merits prompt attention from teachers in schools where physics and chemistry are taught to beginners. Ginn & Co.

American History in Literature. By Martha A. L. Lane and Mabel Hill. The purpose of this volume of historical readings is to gather into as compact form as possible those literary excerpts that bring out clearly the leading events and characteristic conditions that have marked the development of America. The compilation presents certain aspects of American history from the point of view of the poet, the novelist, and the orator, as well as of the historian. The selections serve as most illuminating side lights, and used immediately in connection with the lesson in history will prove of immense value not only in fixing the historical fact but in stimulating to further reading. Libraries are not always within the schoolhouse, not always in juxtaposition with it, and teachers are much troubled to secure literary selections that bear directly on the subject of each day's lesson. But with this admirable and handy compilation on the desk, great labor of search is saved and prompt effect is produced by instant use of the book. The selections are short, are from the best authors, and are accompanied with excellent illustrations. The book is adapted for use in the middle grades of the grammar school, and teachers in these grades will find it exactly to their liking. Ginn & Co.

The Mother-Artist. By Jane Dearborn Mills. The last decade has given us a considerable mother literature, with a growing conception of the school as having important home relations. Several factors have contributed to this result. Among these might be considered, child study and the accompanying sympathetic interest in children; the wider sphere occupied by woman in modern life; humanitarian movements in the interest of the young; and the growth of "education" and "parents" and "mothers'" societies. These have stimulated or been accompanied by a new interest in the care and companionships and occupations and conduct of children in the home. Much has been written of the mother's influence, and the place of the child in the home life, his care and training. Books have been multiplied. Some of them have been helpful. No one of them, it seems to the writer, is more sane, more useful, or more obviously the product of a real family or personal experience than this latest one "The Mother-Artist." Every page reveals the wide minded, large hearted mother. More than once is disclosed the teacher behind the mother. There is no mawkish sentimentality; but indications of a fine culture, acquaintance with the world and the disciplined mind, not less than the gentle heart. It is such a book as one wishes every parent and every teacher might read. The home must keep pace with the on-moving of the great world of thought and achievement outside. "Woman, enriched and broadened by the wider opportunities (of modern life) must bring back to the home the fruits of her gathering abroad." Whatever the conditions of the family the mother, also, must be a growing member. The author exults in the richness of growth that is possible in a mother's life; and makes it seem a simple thing. The contents show chapters on the development of sympathy, intellect, and character in the mother, incident to her position as a mother; upon babies as teachers; men and women in the home; family discipline; the law of natural results as applied to conduct; cares, confusion, and disorder in the household; the home of limited means; and genial adult comradeships with children. Its one hundred and fifty pages are full of suggestion and inspiration and guidance. It has many quotable sentences, striking illustrations, cogent argument, in places, and is withal entertaining throughout. The book deserves, as it will receive, a wide reading. The Palmer Company, Boston. Price, postpaid, $1.

The Golden Goose and Other Fairy Tales. Translated from the Swedish by Eva March Tappan. Children will be delighted with these simple, interesting fairy tales. The translator's name is a sufficient guarantee that the tales are worth translating. The subjects are The Golden Goose, The Giant's House With the Roof of Sausages, The Simple-Minded Giant, The Stolen Princess, The Black Box and the Red, and The Little Wild Man. The large type and effective illustrations will make the book at once attractive to the child. There is a freshness and a strength in the stories that one would expect from the Northland in which they originated. Houghton, Mifflin & Co. Price, $1.

Frozen Dog Tales. By Colonel William C. Hunter. This book is breezy with Western humor and philosophy. It is in prose and verse, and each page has at the top a Western scene in colors suggestive of the experiences and thoughts related in the volume. It is an admirable little book of humor and is published at $1, by The Everett Press, Boston, Mass.

Advanced Civics. By S. E. Forman. The subtitle of the book is The Spirit, the Form, and the Functions of the American Government. Dr. Forman has made an elaborate study of these essentials of our government, and has produced a work that must stand the test of the most exacting criticism. The method of development and treatment employed in elementary text-books in civics is somewhat departed from in this advanced treatise; in the three parts into which the work is divided, part one deals with the underlying principles of our government, part two gives an account of the governmental machine, and part three treats of the everyday work of government and the practical problems connected with the work. The author declares that he has kept constantly in mind during the preparation of the book the truth that instruction in civics should have for its highest aim the indoctrination of the learner in sound notions of political morality, and he believes he has assisted the teacher in achieving this aim wherever such assistance has seemed practicable. Dr. Forman's style is graphic and vivid; he writes with a careful appreciation not only of students' needs and equipment, but with fullest respect for the gravity of his subject and the importance of setting forth the weighty truths with force and dignity. Marshalling the abundant materials in orderly array he has selected and used them with rare power and ability. Dr. Hinsdale's work has long been the larger work on this subject, but with the advent of Dr. Forman's treatise, rich with newer and fresher material and stronger in treatment and breadth of view, the new book will become the stable and worthy standard text-book. Apart from the body of the text there is given a wealth of suggestive questions pertaining to the text and to the experience of the student, requiring research work and conference; these suggestive questions and exercises are a striking and valuable feature of this most excellent work. The Century Company.

Elements of Economics. By Charles Jesse Bullock, Ph.D. It would be a pleasure to introduce Dr. Bullock's book to the many who can see no use in statistics, and disapprove of the large sums spent for the support of statistical bureaus. It would reveal to them a wonderful science made possible by those figures they decry. Indeed, even those who already have no appreciation of the value of statistics can but be surprised to see how from them have been worked out mathematical laws almost as unvarying as the laws of the solar system. The Law of Consumption, Law of Diminishing Returns, and Law of Economy in Organization are a few of those considered in Professor Bullock's treatise. Other chapters are devoted to the Theory of Exchange, Money and Credit, Problems of Money and Banking, Monopolies, Railroad Transportation, International Trade, Distribution of Wealth, Labor Problem, Projects for Economic Reform, and Government Revenues. The final paragraph of most chapters is devoted to conclusions formed from the foregoing facts. Various aspects of the different subjects are presented as, for instance, in the chapter called "The Law of Economy in Organization," both the advantages and disadvantages of large-scale production and large establishments are given in detail. Although this book was prepared in response to a demand for a shorter and more elaborate work than the one entitled "Introduction to the Study of Economics," brought out by Mr. Bullock in 1897, yet here the topics are treated in a thorough manner and the reader finds his every doubt and question is, as it were, foreseen and therefore answered. A most helpful list of books for supplementary study is added to the text. Silver, Burdett & Co. Price, $1.

Ways of Nature. By John Burroughs. This is in every sense an attractive little volume, written by the most serious and yet sympathetic student of nature, in modern times. Mr. Burroughs has carefully guarded his mind against being misled by mere sentiment in his observations of the animal world. He is the most scientific of the popular writers in this field. He takes us into the fields and woods, and in his charming style reveals to us the very sights and sounds that appeal to his own senses. The modern interpretation of nature has been exceedingly helpful to humanity. Fifty years' intelligent study of animate creation has completely transformed the sentiments of mankind toward the inferior animals. We understand them better and treat them better than ever before in the world's history. We recognize our own kinship with the brute creation. This movement of human thought is partly traceable to the marvelous revelations growing out of the studies of Charles Darwin, and men of his stamp. The results of their work have been taken up by a different class of students, such as the author of this book, and have been made available to ordinary people through the medium of a charming literary style. So the world has been taught and led. Mr. Burroughs in his way is as great a benefactor of the human race as Darwin. It is fashionable nowadays to read and enjoy such books as this, and it is a happy fashion. The publishers have co-operated with the author in making the book attractive. The frontispiece suggests the attitude of mind in which the reader should approach the book and the study of nature. It is an interesting picture of an old man absorbed in watching a butterfly. Houghton, Mifflin & Co. Price, $1.10 net.

Economic Geology of the United States. By Heinrich Ries, A.M., Ph.D. The author, Professor Ries, is Assistant Professor of Economic Geology at Cornell University. The book covers the ground which is gone over in the elementary course in geology at Cornell University. This insures its being adaptable to a similar use in other colleges. In arrangement the non-metallic minerals are discussed first, and the metallic minerals last. The author vindicates this method which is here used, we believe, for the first time in a book on this subject, on the ground that the non-metallic minerals are of the most importance; the value of their production having exceeded the metallics by over $150,000,000 in 1903; also because it presents the simpler before the more complex forms of mineral deposits. All the latest scientific information is given concerning gold, petroleum, natural gas, the building stones, clay, lime, salts, gypsum, fertilizers, abrasives, and the minor minerals; also water, and soils, and road materials. Part second takes up ores, deposits, iron, copper, lead, gold, silver, etc. A comprehensive presentation of what should be known by every well-educated person in regard to these subjects is included in the volume, which is richly illustrated with pictures, maps, tables, charts, etc. A full index makes the entire contents easily accessible. The Macmillan Company. Price $2.60.

Letters to Beany, or the Love Letters of Plupy Shute. This is the third book in the series beginning with "The Real Diary of a Real Boy," and is written by Judge Henry A. Shute. These books have made a reputation for the author as one of the real humorists of modern times. They portray the typical experiences of the real boy, and provoke many wholesome fits of laughter in the reader. Uniform in size and bound in cloth. Postpaid, 50 cents each. The Everett Press Co., Publishers.

Famous American Authors. By Sarah K. Bolton. This is a beautifully made volume, artistic from cover to cover, and treats of the lives of Ralph Waldo Emerson, Nathaniel Hawthorne, Henry W. Longfellow, John G. Whittier, Oliver Wendell Holmes, and James Russell Lowell. There are twenty-five illustrations, both portraits and places, the latter including homes and grounds of these celebrated authors. The portraits are exceptionally fine engravings, the type is large and clear, much new material that is interesting and suggestive is included in the texts. The author is a finished writer whose acquaintance and literary experience has been broad. She is able to give us fascinating sketches of the subjects of whom she writes. The book is a choice gift book, and will be read with greatest interest by all well educated Americans who are fond of literature and who have the opportunity to peruse these fascinating pages. Thomas Y. Crowell & Co.

French Pathfinders in America. By William Henry Johnson. A graphic narrative of French explorations in the New World makes up the substance of this book. It relates the adventures and discoveries of such men as Cartier, Champlain, Marquette, La Salle, Jean Ribaut, Jean Nicollet, and others whose names still survive and are perpetuated by the towns, cities, rivers, and mountains that have been named after them. There are seven full page plates. These sidelights from monographs giving us specialized studies in the early history of our great country are exceedingly interesting and useful. They make history real. There is not a dull page in this volume, which is adapted to school use or for general reading. It belongs to an interesting series of historic studies published by Little, Brown & Co. Price $1.50 each.

The True Story of Paul Revere. By Charles Ferris Gettemy. It is a happy thought to make a complete book describing the life of this early American hero. A full account is given of his midnight ride, his arrest and court-martial, and his useful public service. Every school child is interested in this story, and will be glad to be read to or to himself read out of this volume. It throws interesting light upon many incidents in the life of a man who had a substantial part to play in the determining of the destiny of our country in the earlier times. The illustrations will appeal to the mind, as they present some of the stirring events of the times in a spirited way. The publishers of this book are developing a most interesting list of books for supplementary reading. Little, Brown & Co. Price $1.50 net.

The Happy Life. By Charles W. Eliot. President Eliot published a little book with this title six years before Pastor Wagner's "Simple Life" appeared. Many people have found it as suggestive and helpful as the latter book. The object of both volumes is the same; namely, to show what in this life is worth while, and how to attain it. It is an intensely vital and practical monograph. The table of contents sufficiently indicates its scope. It treats of the moral purpose of the Universe; lower and higher pleasures; family love; pleasure in bodily exertion; pleasure of reading; mutual service and co-operation; the selection of beliefs, and the conflict with evil. Surely every thoughtful person can find something in one or another of these chapters, from the pen of the greatest of living educators, to cheer, strengthen, and encourage. Thomas Y. Crowell & Co. 75 cents net.

Representative Essays on the Theory of Style. By William T. Brewster. Professor Brewster is adjunct professor of English in Barnard College, and is by training and practice amply equipped to chose and edit such essays on style as are not only pertinent to his work but valuable to the general reader and student for comparison and study. The essays are selected from a contemporary rather than a historical point of view, and taken collectively, they represent the more important bearings of the subject with as little repetition and in as much variety of idea as possible. The essays are from the following authors: Cardinal Newman, De Quincey, Herbert Spencer, George Henry Lewes, R. L. Stevenson, Walter Pater, and Frederic Harrison. A series of notes and questions on the essays furnishes illumination and incentive to further study and reflection. The gathering of these essays into one volume affords the student a means of comparison which would otherwise be wanting or secured only after much search. All students of literature will find this to be a most suggestive and inspiring book. Macmillan Company.

The Life That Counts. By Samuel Valentine Cole. President Cole of Wheaton Seminary, Norton, Mass., has written another of the rapidly multiplying inspiration books; notable examples of which have been President Eliot's "The Happy Life," and Pastor Wagner's "The Simple Life." In the introduction he says, "What counts is the good life; there is no other worth living." Under chapter headings that are somewhat fanciful, such as Burning Lamps and Coals of Fire; The Face of a Man; The Face of a Lion; The Face of an Ox; The Face of an Eagle; And Losing and Finding, he preaches a series of eloquent sermons that teach the great verities of the intellectual and spiritual life. In the midst of the overwhelming deluge of light literature which is flooding the world at the present day, it is refreshing to turn aside into the peaceful range of such a book as this, and to stop and think what we are; why we live; and whither we are going. No one can read these pages without being more anxious to live nobly and more self-sacrificingly. Thomas Y. Crowell & Co. Price, 75 cents net.

Select Poems of Robert Browning. By A. J. George, A.M., Litt.D. The selections in this volume are arranged in chronological order, and are illustrative of the characteristics of the author. The edition is intended for convenient study in the schools or by clubs. The notes and other helps will aid the general reader to comprehend this somewhat difficult poet. The volume is substantially bound and is published by Little, Brown & Co., Boston, Mass.

Periodical Notes

Everybody's for January is an automobile number. It also contains a good story by Juliet Wilbor Tompkins entitled "Mother's Daughter."—An article of great interest to lovers of science is George H. Guy's "Electricity's Farthest North" in the January *Cosmopolitan*.—Robert Kennedy Duncan, Professor of Chemistry in Washington and Jefferson College, contributes to *Harper's Magazine* his first article on "The Chemistry of Commerce," the first of a very important group of papers which he went abroad to write for *Harper's*.—Among the good things promised for 1906 by the *Atlantic Monthly* are articles by experts on "What personal qualities are essential, under modern conditions, for eminent service in the law, in the ministry, in medicine, journalism, etc." There is an excellent review of "The Juvenile Books of the Season" by Montrose J. Moses, in *The Independent* of December 14.—An article of interest to educators appears in the current *International Quarterly*, "The Social Significance of Underfed Children," by Robert Hunter. The *Quarterly* is published by Fox, Duffield & Co., New York, N. Y. —Mr. Ernest Thompson Seton begins in *Scribner's* for January an account of "The Wapiti and His Antlers," a series of papers on the great horned game of America.